

IN THE CLAIMS:

1 1. – 46. (Cancelled)

1 47. (Previously Presented) A monitoring device for monitoring a household electric user
2 presenting an electric load, the monitoring device being connected between a source of
3 electric energy and the electric load and including:

4 A. a detector for determining at various times the quantity of electric power or
5 current absorbed by the electric user,

6 B. a memory for retaining reference data or profiles of electric power or current
7 that are absorbed during operating cycles of a corresponding type of electric
8 user;

9 C. a processor for determining status information that is representative of the
10 present status or phase of operation of the household electric user based on the
11 quantities of electric power or current determined by the detector and the
12 stored reference values; and

13 D. communication means for providing the status information to an external de-
14 vice.

1 48. (Currently Amended) The device, according to claim 47, wherein,

2 i. the processor further determines efficiency information being representative
3 of the efficiency or performance status of the household electric user based on
4 the quantity of electric power or current determined by the detector and the
5 stored reference values, and

6 ii. the communication means provides the efficiency information to an external
7 device.

1 49. (Previously Presented) The device, according to claim 47, wherein,

2 i. the processor further determines wear information relating to estimating the
3 wear status of components of the household electric user, and
4 iii.ii. the communication means provides the wear information to an external de-
5 vice.

1 50. (Previously Presented) The device, according to claim 47, wherein the reference data
2 or profiles contained in the memory are representative of a theoretical level of absorption
3 of electric power or current that the household electric user would absorb if operating
4 correctly under normal conditions.

1 51. (Previously Presented) The device, according to claim 50, wherein the processor
2 compares the quantities determined by the detector with the reference data or profiles to
3 determine the status information.

1 52. (Previously Presented) The device, according to claim 47, wherein the processor
2 provides the status information to the memory.

1 53. The device, according to claim 52, wherein the processor further:

- 2 a. determines efficiency information indicating the quality of operation of
- 3 the household electric user and/or the efficiency status of its internal com-
- 4 ponents, the efficiency information relating to deviations which are con-
- 5 sidered significant between the quantities determined by the detector and
- 6 the stored reference data or profiles,
- 7 b. determines wear information relating to the wear status of components of
- 8 the household electric user and/or the modes of previous use of the house-
- 9 hold electric user, and
- 10 c. retains the efficiency and wear information in the memory.

1 54. (Previously Presented) The device, according to claim 47, wherein the communica-
2 tion means includes a connection to a communication bus, the communication means
3 making the status information available to the bus and receiving instructions from the
4 bus.

1 55. (Previously Presented) The device, according to claim 47, wherein the communica-
2 tion means is a connection to an external electronic apparatus the communication means
3 providing the external electronic apparatus access to the status information and access to
4 the programming of the device.

1 56. (Previously Presented) The device, according to claim 53, wherein the communica-
2 tion means is a connection to an external electronic apparatus, the communication means

3 providing the external electronic apparatus access to the status, efficiency and wear in-
4 formation and access to the programming of the device.

1 57. (Previously Presented) The device, according to claim 47, further including a switch
2 that operates under the control of the processor for interrupting the electric supply to the
3 household electric user.

1 58. (Previously Presented) The device, according to claim 54 further including a switch
2 that operates under the control of the processor for interrupting the electric supply to the
3 electric user, the processor controlling the switch based on instructions received over the
4 bus.

1 59. (Previously Presented) The device, according to claim 47, further including configu-
2 ration means for selecting, among a plurality of possible selections, the type of electric
3 user that corresponds to the household electric user.

1 60. (Currently Amended) The device, according to claim 59, wherein

2 a. the memory contains a plurality of reference data or profiles relating to the
3 operations of various types of electric user, and

4 | b. the configuration means ~~selectes~~selects the reference data or profile relating

5 to the particular household electric user that is associated with the device.

1 61. (Previously Presented) The device, according to claim 57, further including manual
2 controls for the switch.

1 62. (Previously Presented) The device, according to claim 47, further including
2 a. a current differential sensor for detecting current leaks to ground,
3 b. the processor using the sensor readings to analyse the operations of the
4 household electric user.

1 63. (Previously Presented) The device, according to claim 47, further including
2 a. a temperature sensor for sensing ambient temperature, and
3 b. the processor using the ambient temperature information to analyse the
4 operations of the household electric user.

1 64. (Previously Presented) The device, according to claim 47, wherein the communica-
2 tion means is an asynchronous serial line.

1 65. (Previously Presented) The device, according to claim 56, further including acoustic
2 and/or optical signalling means under the control of the processor for signalling anoma-
3 lous conditions of operation of the household electric user.

1 66. (Previously Presented) The device, according to claim 58, further including acoustic
2 and/or optical signalling means under the control of the processor for signalling the status
3 of the switch.

1 67. (Currently Amended) The device, according to claim 58, wherein the processor re-
2 ceives information from one or more external sensors ~~such as~~, where the one or more
3 external sensors is a gas sensor, a flood sensor, or a smoke sensor, and the processor con-
4 trols the switch to interrupt the electric supply based, in part, on the readings of the exter-
5 nal sensors.

1 68. (Previously Presented) A method for monitoring the status of a household electric
2 user, the method including the steps of:
3 A. measuring the absorption of electric power or current by the household
4 electric user at various times;
5 B. analyzing the measured electric power or current absorption based on
6 reference electric power or current absorption data or profiles relating to
7 operating cycles of an electric user of a corresponding type;
8 C. determining status information being indicative of the status or phase of
9 operation of the household electric user based on the results of step B; and
10 D. storing the status information.

1 69. (Previously Presented) The method of claim 68 further including
2 E. determining efficiency information relating to the efficiency of the house-

3 hold electric user during the operating cycles based on reference data or
4 profiles and the measured absorption; and
5 F. storing the efficiency information.

1 70. (Previously Presented) The method of claim 68 further including

2 E. determining wear information based on the number and types of operating
3 cycles performed by the household electric user; and

4 F. storing the wear information.

1 71. (Previously Presented) The method of claim 70 further including

2 G. determining efficiency information relating to the efficiency of the house-
3 hold electric user during the operating cycles based on reference data or
4 profiles and the measured absorption; and

5 h. storing the efficiency information.

1 72. (Previously Presented) The method, according to claim 68, wherein the absorption is
2 measured instant by instant to determine an absorption profile which expresses the evolu-
3 tion in time of the real level of absorption of electric power or current by the household
4 electric user.

1 73. (Previously Presented) The method, according to claim 68, wherein the reference ab-
2 sorption profile is representative of the evolution in time of a theoretical level of absorp-
3 tion of electric power or current that the household electric user would produce if operat-

4 ing correctly.

1 74. (Previously Presented) The method, according to claim 68 further including a step of
2 selecting the reference absorption data or profile from among a plurality of reference ab-
3 sorption data sets or profiles.

1 75. (Previously Presented) The method, according claim 74, wherein the reference ab-
2 sorption data sets or profiles are obtained through experimental analysis.

1 76. (Previously Presented) The method, according to claim 68, wherein the status infor-
2 mation is of the functional type, concerning the present mode of operation of the house-
3 hold electric user.

1 77. (Previously Presented) The method, according to claim 69, wherein the efficiency
2 information are of the diagnostic type, concerning the quality of operation of the house-
3 hold electric user and/or the efficiency status of its internal components, the efficiency
4 information resulting from the detection of deviations being considered significant be-
5 tween the measured absorption and the applicable reference absorption data or profile.

1 78. (Previously Presented) The method, according to claim 70, wherein the wear informa-

2 tion are of the statistical type, concerning the wear status of internal components of the
3 household electric user and/or its modes of previous use.

1 79. (Previously Presented) The method, according to claim 78, wherein the wear informa-
2 tion are determined based on an analysis of the status information over time.

1 80. (Previously Presented) The method, according to claim 70, further including the step
2 of providing certain of the status, efficiency and/or wear information to a communication
3 network to which a plurality of household electric users are connected.

1 81. (Currently Amended) The method, according to claim 80, wherein the information is
2 used for estimating the functional and/or wear status of internal components of the elec-
3 tric user in aid in the repair and/or maintenance of the household electric user.

1 82. (Previously Presented) The method, according to claim 80, wherein certain of the in-
2 formation is used for rationing the electric power absorption in the household environ-
3 ment in which the electric user is installed.

1 83. (Previously Presented) The method, according to claim 82, further including the step
2 of controlling, from a remote location, the operating status of the household electric user,

3 for realizing the activation and/or deactivation of the user, based on the information pro-
4 vided over the communication network.

1 84. (Previously Presented) The method, according to claim 77, further including activa-
2 tion of acoustic and/or optical signalling means when the household electric user is mal-
3 functioning.

1 85. (Previously Presented) A system for monitoring and controlling household appli-
2 ances that utilize power from the electric mains, the system including:

- 3 A. one or more first household appliances that communicate over a commu-
4 nication network; and
- 5 B. one or more monitoring devices for monitoring and controlling a corre-
6 sponding number of second household appliances, each monitoring device
7 communicating over the communication network on behalf of the associ-
8 ated second household appliance and including:
 - 9 i. a detector for determining at various times the quantity of electric
10 power or current absorbed by the associated second household ap-
11pliance,
 - 12 ii. a memory for retaining reference data or profiles of electric power
13 or current absorbed during operating cycles of a corresponding
14 type of household appliance;
 - 15 iii. a processor for determining status information that is representa-
16 tive of the present status or phase of operation of the second

17 household appliance based on the quantity of absorbed electric
18 power or current determined by the detector and the stored refer-
19 ence data or profiles; and
20 iv. a node for communicating on the communication network, the
21 node providing the status information over the network.

1 86. (Currently Amended) The system, according to claim 85, wherein
2 | iv.v. the monitoring device further determines efficiency information representative
3 of the efficiency or performance status of the associated second household ap-
4pliance based on the quantity of absorbed electric power or current determined
5 by the detector and the stored reference data or profiles, and
6 | v.vi. the node provides the efficiency information over the network.

1 87. (Currently Amended) The device, according to claim 85, wherein,
2 | ii.v. the monitoring device further determines wear information relating to estimat-
3ing the wear status of components of the associated second household appli-
4ance, and
5 vi. the node provides the efficiency information over the network.

1 88. (Previously Presented) The device, according to claim 85, wherein the reference data
2 or profiles are representative of a theoretical level of absorption of electric power or cur-
3rent that the associated second household appliance would absorb if operating correctly
4 under normal operating conditions.

1 89. (Previously Presented) The system of claim 85 further including

2 | i.v. a meter for measuring electric power or current absorbed by the household,
3 | the meter communicating the measured household absorption values over the
4 | communication network, and
5 | ii.vi. at each of the first household appliances limiting power or current absorption
6 | based on the communicated household absorption values and a predetermined
7 | maximum absorption value, and
8 | iii.vii. at each monitoring device limiting the power or current absorption by the as-
9 | sociated second household apparatus based on the communicated household
10 | absorption values and a predetermined maximum absorption value.

1 | 90. (Previously Presented) The system of claim 89 wherein the meter communicates the
2 | household absorption value with variable frequency based on how close the measured
3 | household value is to the predetermined maximum value.

1 | 91. (Previously Presented) The system of claim 85 wherein the communication network
2 | is a powerline carrier network.

1 | 92. (Previously Presented) The system of claim 85 wherein the monitoring device con-
2 | trols the activation and deactivation of the associated second household appliance based
3 | on information communicated over the communication network.

1 93. (Previously Presented) The system of claim 92 wherein the monitoring device con-
2 trols the second household appliance based on information provided to the network by an
3 external device.

1 94. (Previously Presented) The system of claim 93 wherein the information is supplied to
2 the network by a mobile telephone.

1 95. (Previously Presented) The system of claim 93 wherein the information is supplied to
2 the network from a remote network.

1 96. (Previously Presented) The system of claim 95 wherein the remote network is the
2 internet.